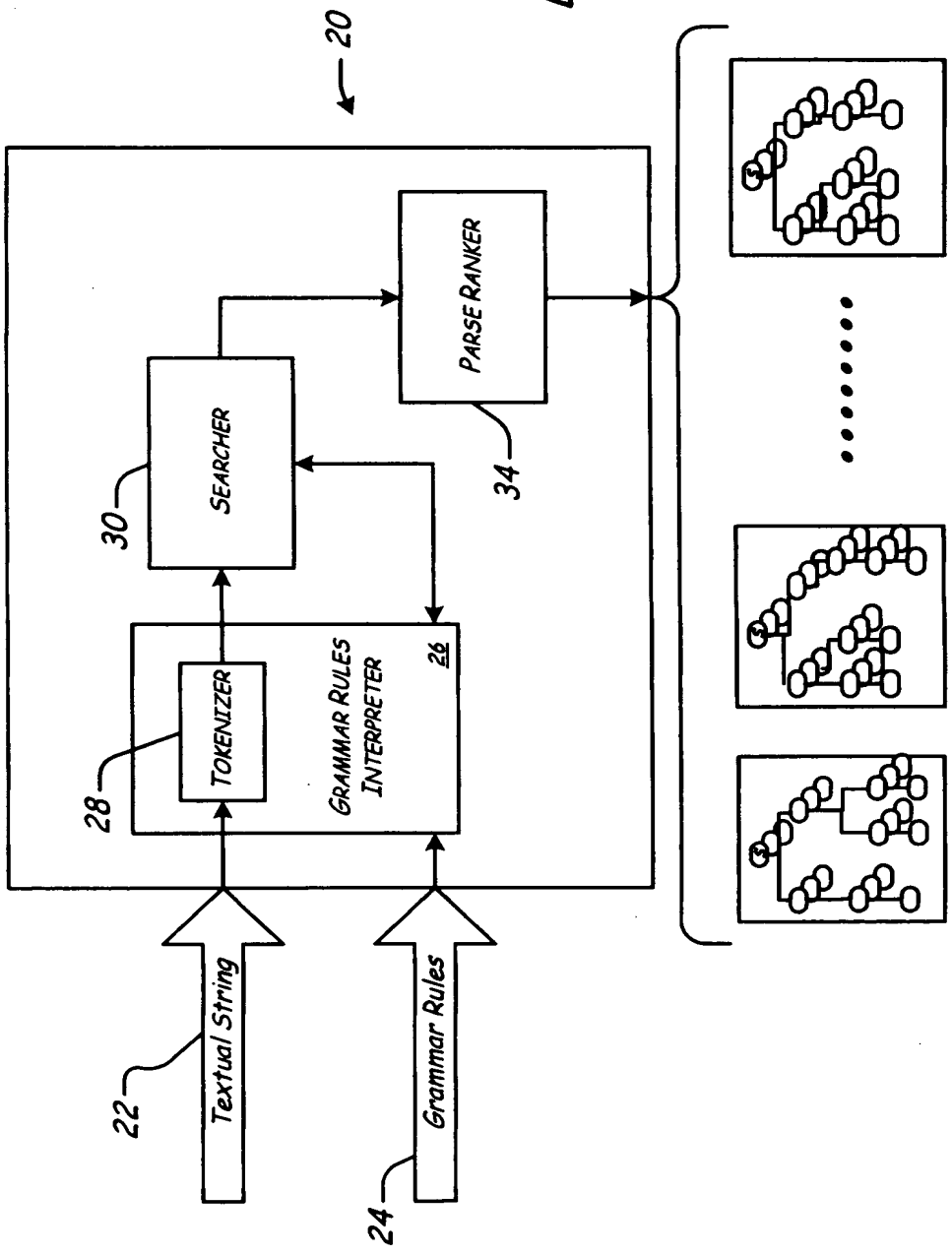


FIG. 1
Background

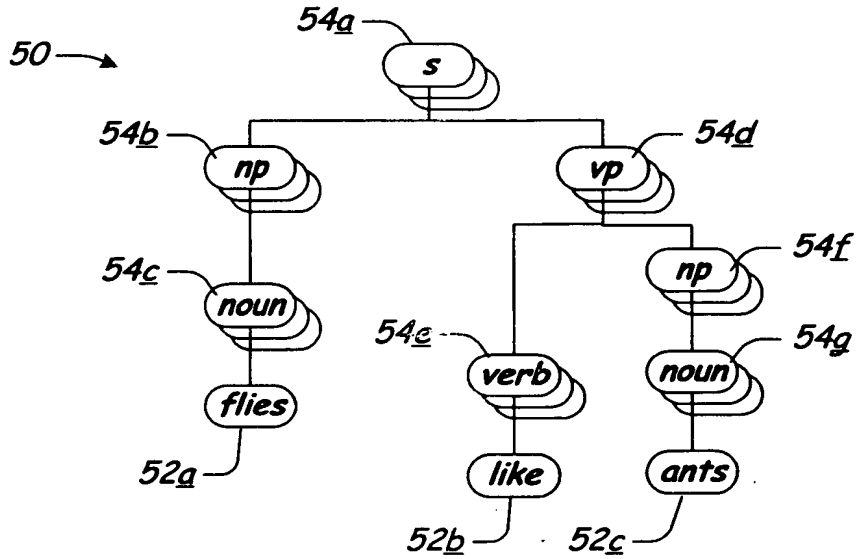
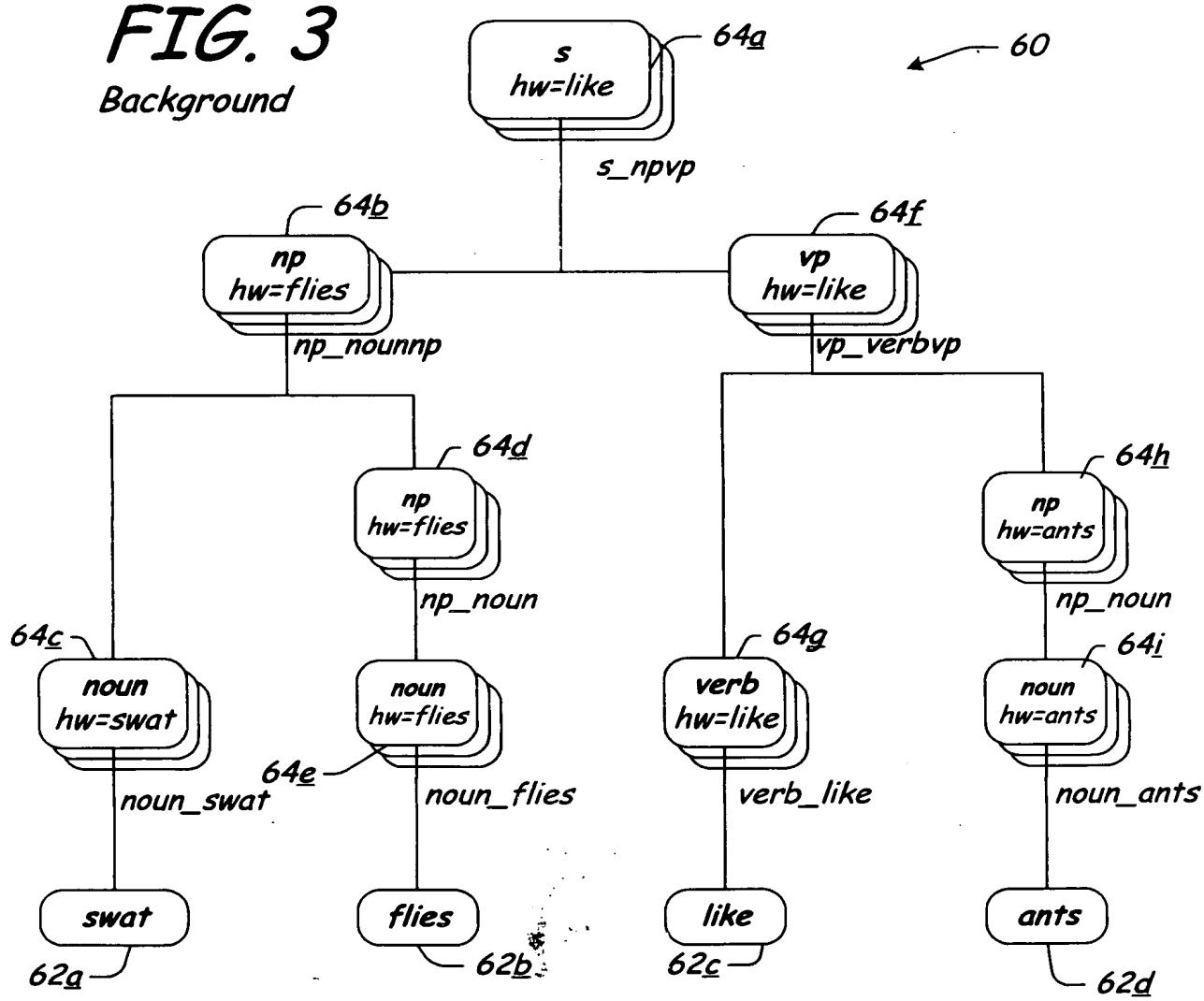


FIG. 2
Background

FIG. 3
Background



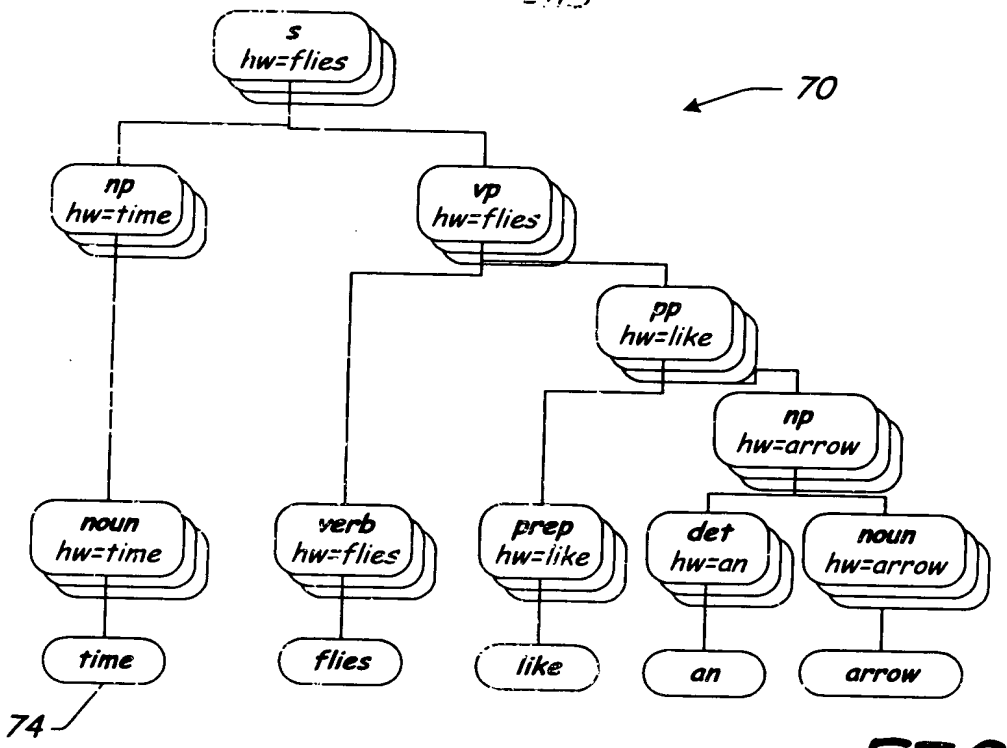


FIG. 4a
Background

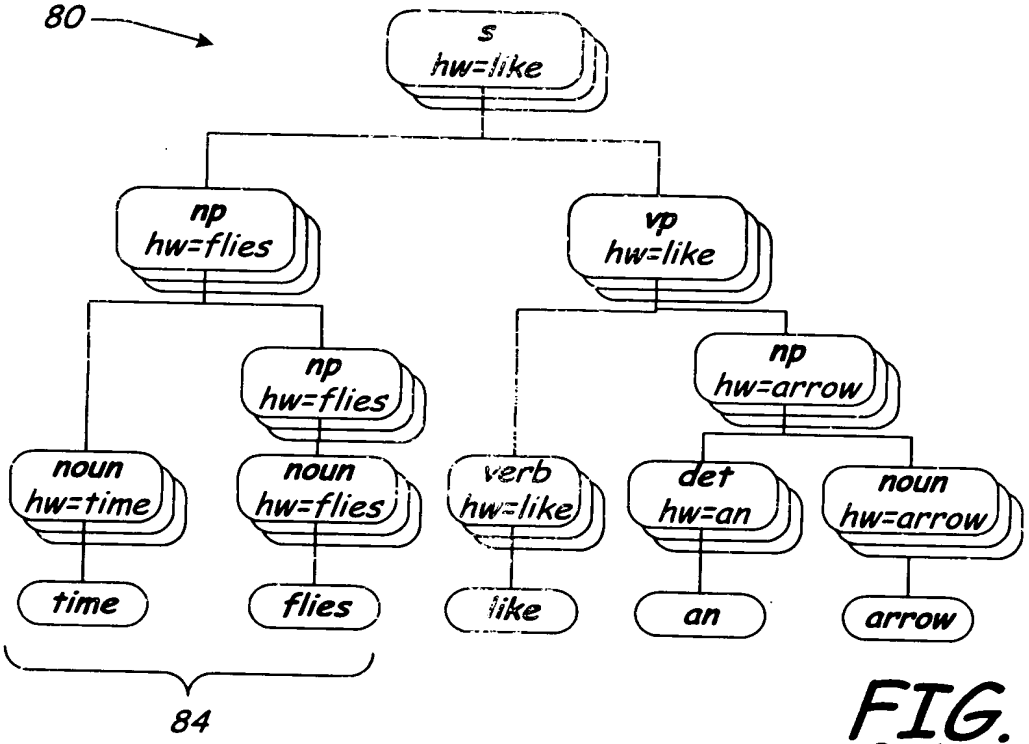


FIG. 4b
Background

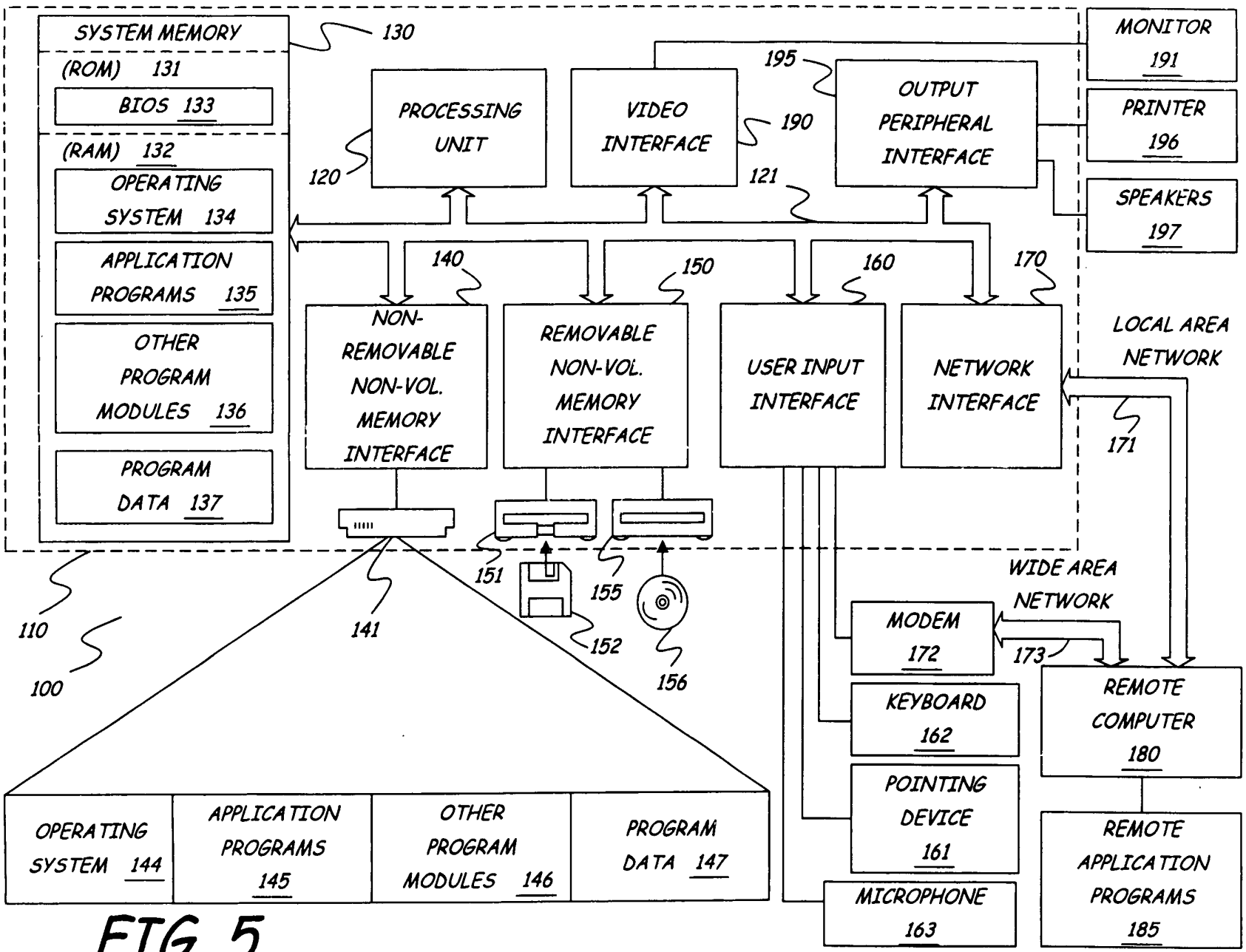

SYSTEM MEMORY
130
(ROM) 131
BIOS 133
(RAM) 132
OPERATING SYSTEM 134
APPLICATION PROGRAMS 135
OTHER PROGRAM MODULES 136
PROGRAM DATA 137
PROCESSING UNIT
120
VIDEO INTERFACE
190
OUTPUT PERIPHERAL INTERFACE
195
121
MONITOR 191
PRINTER 196
SPEAKERS 197
140
150
160
170
NON-REMOVABLE NON-VOL. MEMORY INTERFACE
REMOVABLE NON-VOL. MEMORY INTERFACE
USER INPUT INTERFACE
NETWORK INTERFACE
LOCAL AREA NETWORK
171
151
155
152
156
110
100
141
WIDE AREA NETWORK
MODEM 172
173
KEYBOARD 162
POINTING DEVICE 161
MICROPHONE 163
REMOTE COMPUTER 180
REMOTE APPLICATION PROGRAMS 185
OPERATING SYSTEM 144
APPLICATION PROGRAMS 145
OTHER PROGRAM MODULES 146
PROGRAM DATA 147

FIG. 5

4/13

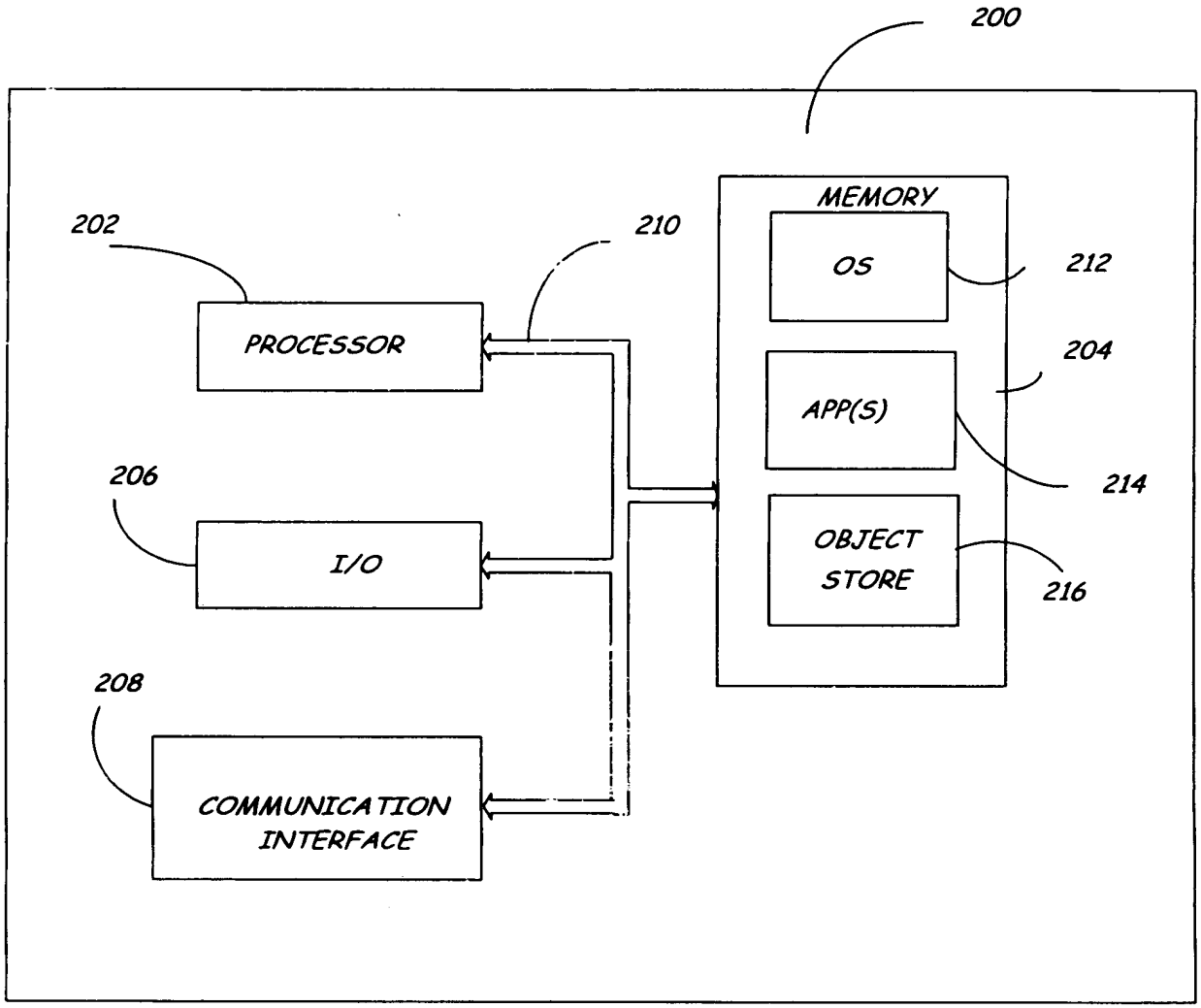

200
MEMORY
202
210
OS
212
PROCESSOR
204
APP(S)
214
206
I/O
OBJECT STORE
216
208
COMMUNICATION INTERFACE

FIG. 6

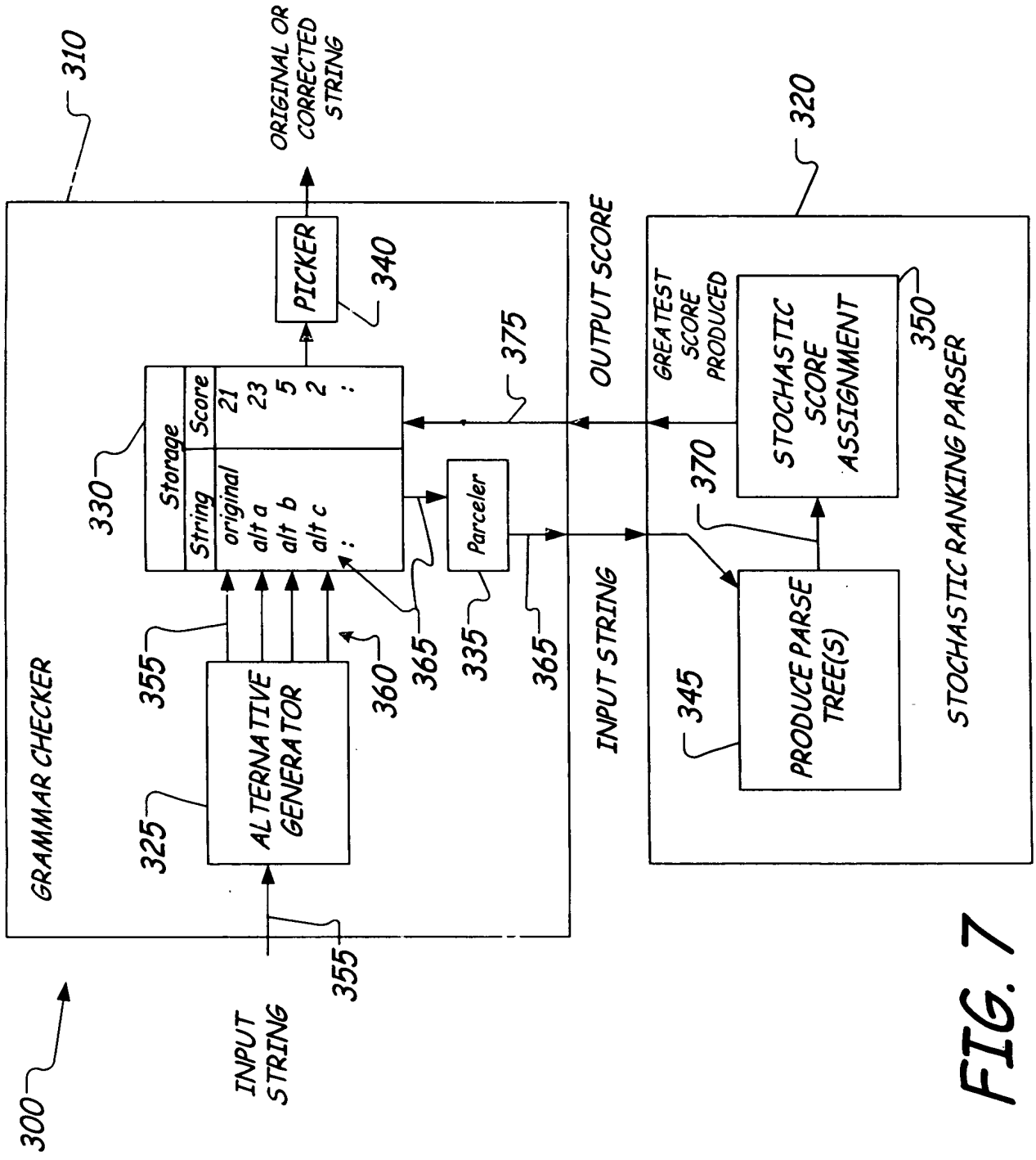

300
INPUT STRING
310
GRAMMAR CHECKER
ORIGINAL OR CORRECTED STRING
PICKER
340
375
OUTPUT SCORE
320
GREATEST SCORE PRODUCED
STOCHASTIC SCORE ASSIGNMENT
350
330
Storage
String
Score
original
alt a
alt b
alt c
21
23
5
2
370
Parceler
355
325
ALTERNATIVE GENERATOR
360
365
335
365
INPUT STRING
345
PRODUCE PARSE TREE(S)
STOCHASTIC RANKING PARSER
355

FIG. 7

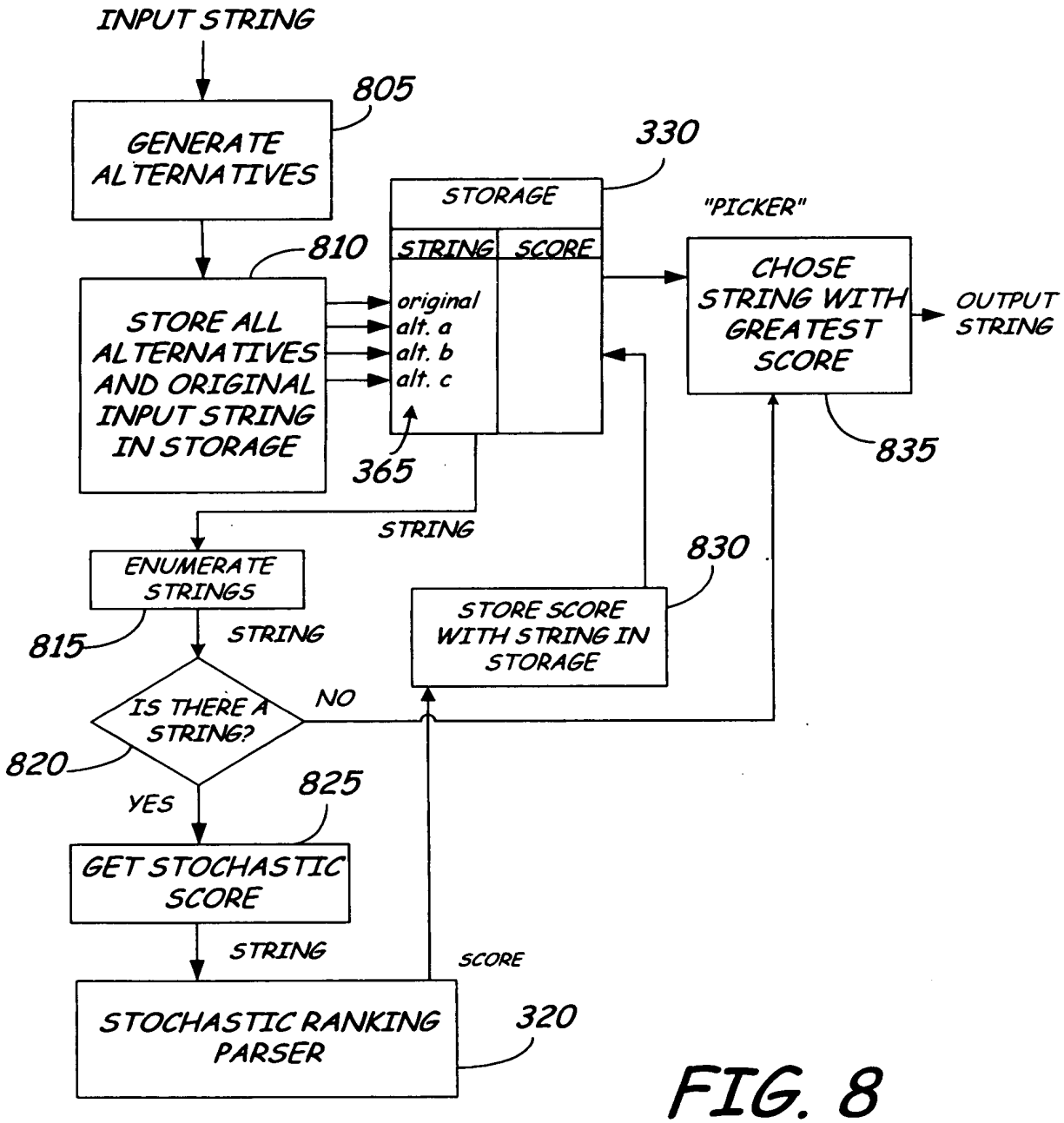

INPUT STRING
GENERATE ALTERNATIVES
805
STORE ALL ALTERNATIVES AND ORIGINAL INPUT STRING IN STORAGE
810
STORAGE
330
STRING
SCORE
original
alt. a
alt. b
alt. c
365
"PICKER"
CHOSE STRING WITH GREATEST SCORE
OUTPUT STRING
835
STRING
ENUMERATE STRINGS
815
STRING
IS THERE A STRING?
820
NO
YES
STORE SCORE WITH STRING IN STORAGE
830
825
GET STOCHASTIC SCORE
STRING
SCORE
STOCHASTIC RANKING PARSER
320

FIG. 8

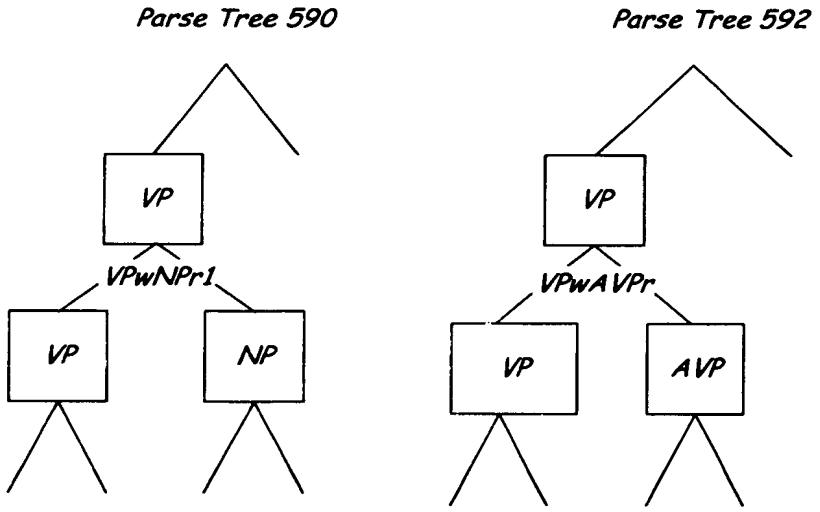

Parse Tree 590
VP
VPwNPr1
VP
NP
Parse Tree 592
VP
VPwAVPr
VP
AVP

FIG. 9a

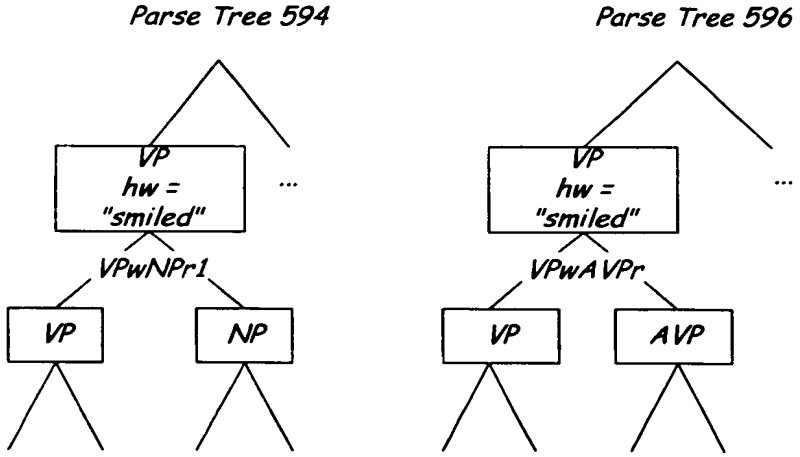

Parse Tree 594
VP
hw =
"smiled"
...
VPwNPr1
VP
NP
Parse Tree 596
VP
hw =
"smiled"
...
VPwAVPr
VP
AVP

FIG. 9b

Rule Name	Rule				Description (and an example)
VERBtoVP	VP	→	VERB		Promote a verb into a verb phrase
PredAdj	VP	→	VP	AJP	Add on an adjective. *"It has been found effective"*
VPwNPr1	VP	→	VP	NP	Add direct object to a VP *"I hit Bill"*
Perfect	VP	→	VP	VP	Adds the VP "have" to a VP *"Joe had gone"*
SubjPQuant	VP	→	NP	VP	Add quantifiers to the VP like "all", "both", ... *"The children have all gone"*
VPwNP1	VP	→	NP	VP	Add noun subject to a VP *"John jumped."*
SubjectAJP	VP	→	AJP	VP	Add AJP subject to a VP *"More surprising is his attitude"*
InvertAJPwS	VP	→	AJP	VP	Add final modifier, AJP, to the left of a VP *"More remarkable still, he went"*
Topicalization	VP	→	NP	VP	Add object of VP, NP, to the left of a VP *"A better-looking man I have not seen"*

FIG. 10

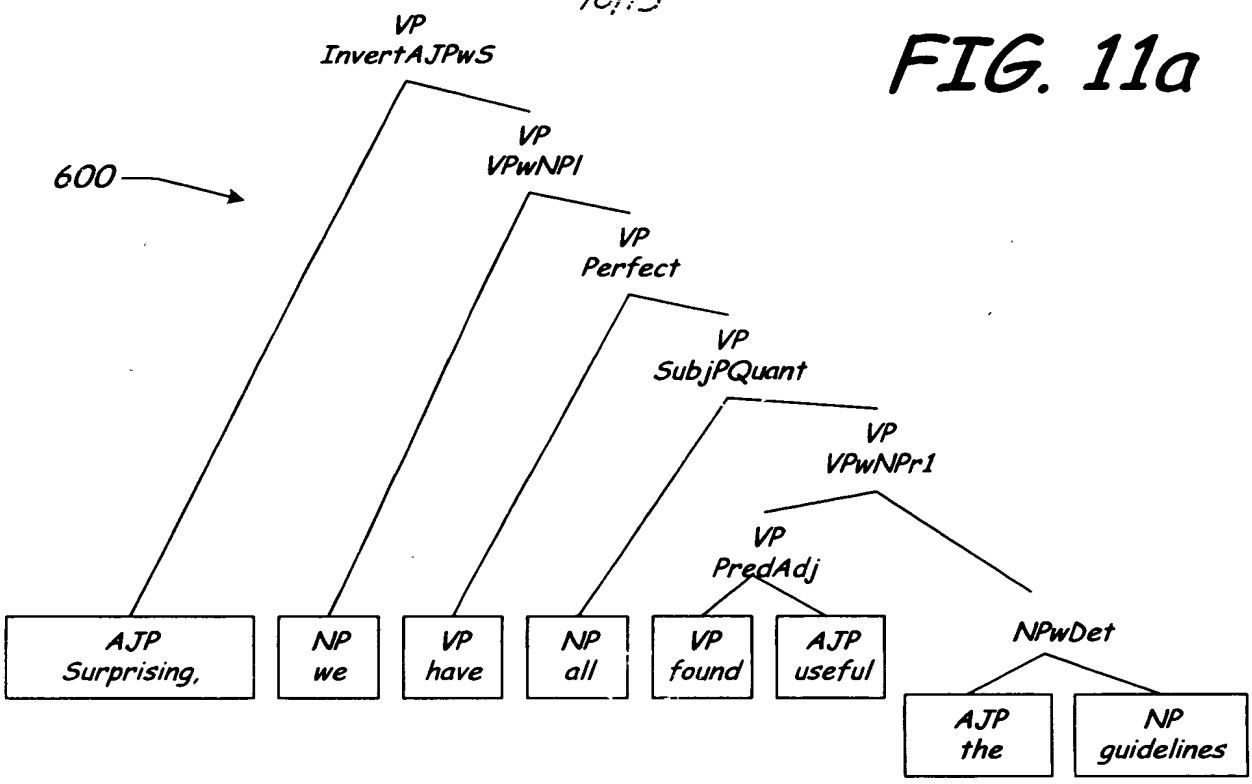


FIG. 11a

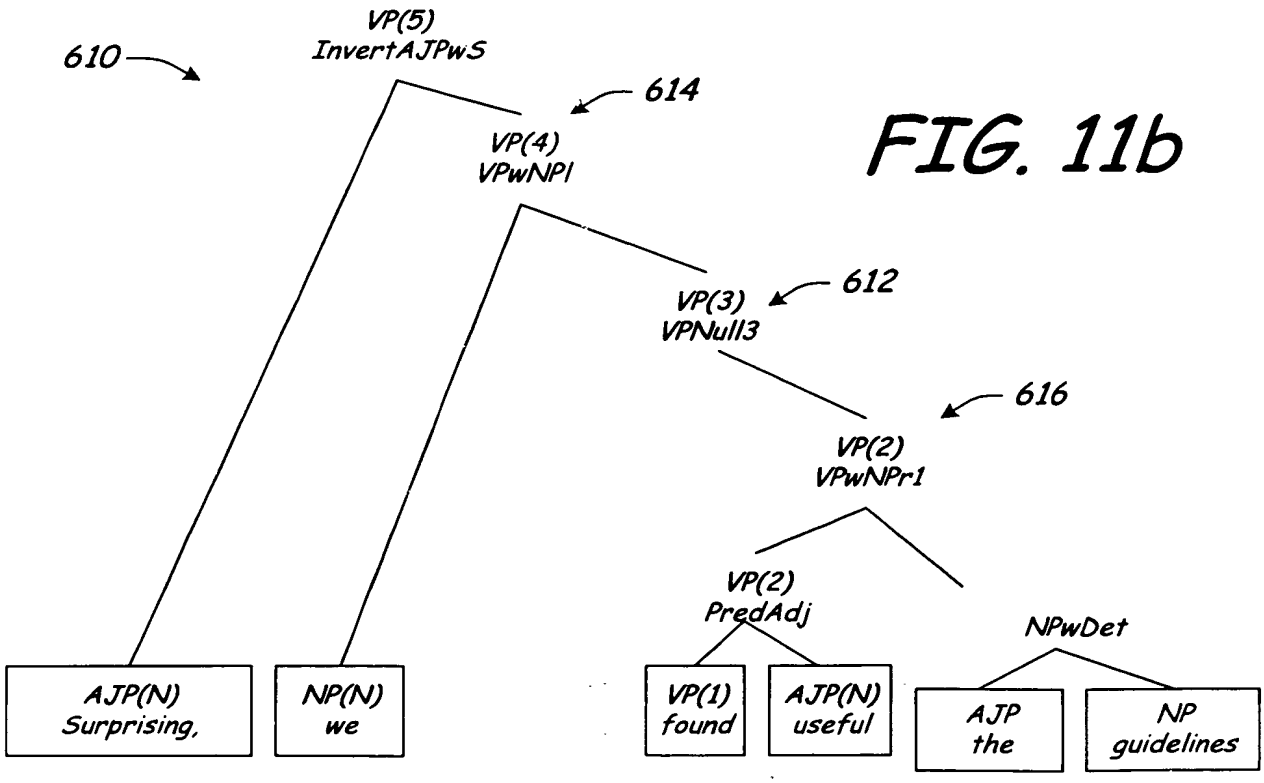


FIG. 11b

FIG. 12

Phrase Level	Rule Name	Rule			Level Description
1	VERBtoVP	VP(1) →	VERB(PL_Verb_Max)		Create a VP
2	PredAdj	VP(2) →	VP(1)	AJP(PL_AJP_Max)	Add post modifiers
	VPwNPr1	VP(2) →	VP(1)	NP(PL_AJP_Max)	
	VPNull2	VP(2) →	VP(1)		
3	Perfect	VP(3) →	VP(1)	VP(2,3)	Add "have" and quantifiers
	SubjPQuant	VP(3) →	NP(PL_NP_Max)	VP(2,3)	
	VPNull3	VP(3) →	VP(2)		
4	VPwNP1	VP(4) →	NP(PL_NP_Max)	VP(3)	Add subject
	SubjectAJP	VP(4) →	AJP(PL_AJP_Max)	VP(3)	
	VPNull4	VP(4) →	VP(3)		
5	InvertAJPwS	VP(5) →	AJP(PL_AJP_Max)	VP(4)	Add modifiers to VPs that have a subject
	Topicalization	VP(5) →	NP(PL_NP_Max)	VP(4)	
	VPNull5	VP(5) →	VP(4)		

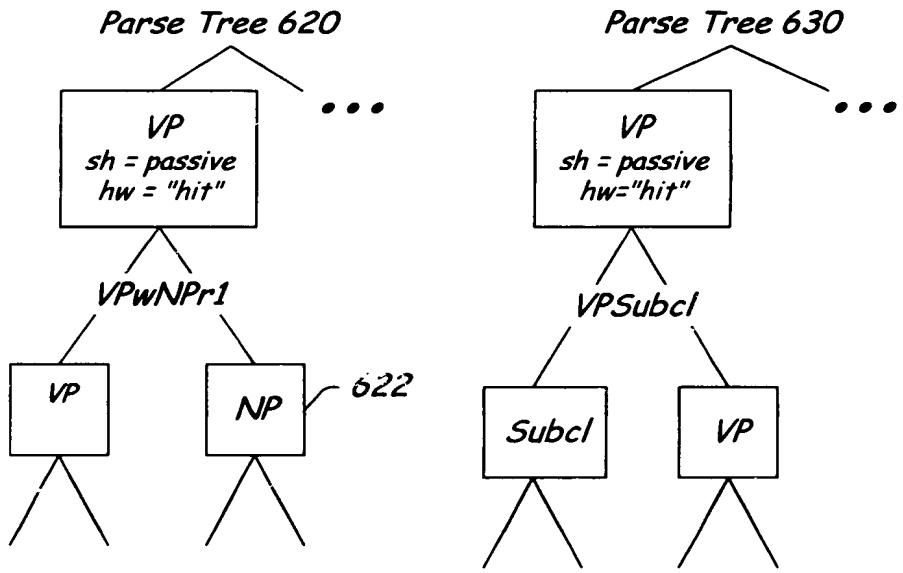

Parse Tree 620
VP
sh = passive
hw = "hit"
VPwNPr1
VP
NP
622
Parse Tree 630
VP
sh = passive
hw="hit"
VPSubcl
Subcl
VP

FIG. 13

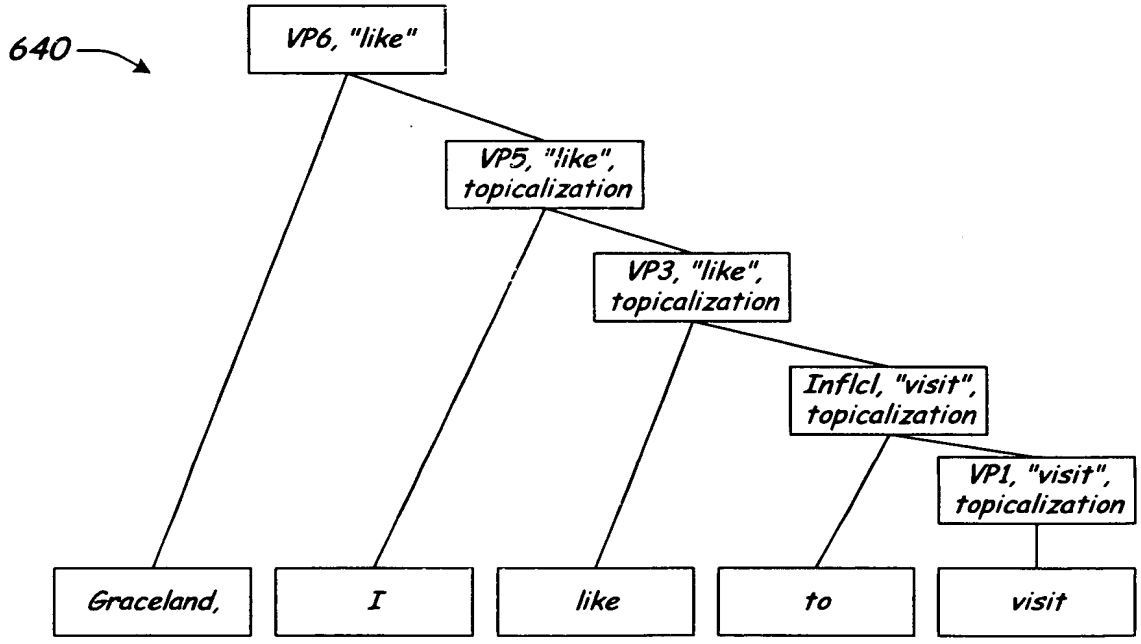

640
VP6, "like"
VP5, "like", topicalization
VP3, "like", topicalization
Inflcl, "visit", topicalization
VP1, "visit", topicalization
Graceland,
I
like
to
visit

FIG. 14

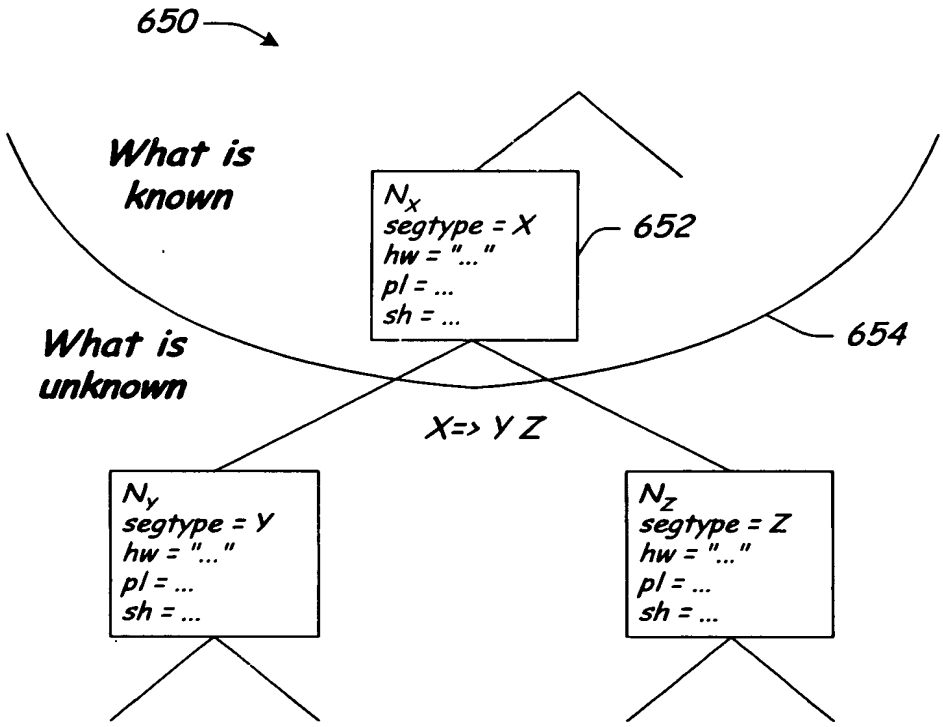

650
What is known
What is unknown
N_X
segtype = X
hw = "..."
pl = ...
sh = ...
652
654
X=> Y Z
N_Y
segtype = Y
hw = "..."
pl = ...
sh = ...
N_Z
segtype = Z
hw = "..."
pl = ...
sh = ...

FIG. 15